

AMENDMENTS TO THE CLAIMS

Claims 1-33 (Cancelled)

34. (Previously Presented) A particle beam irradiation system, comprising:

a charged particle beam generation apparatus; and

an irradiation apparatus for exposing an irradiation target to a charged particle beam emitted from the charged particle beam generation apparatus;

wherein said irradiation apparatus includes a scattering device for increasing the size of said charged particle beam and a Bragg peak spreading device through which said charged particle beam passes; and

wherein at least one of said scattering device and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner as to be movable in a propagation direction of said charged particle beam, and a control apparatus controls movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

35. (Previously Presented) A particle beam irradiation system, comprising:

a charged particle beam generation apparatus; and

an irradiation apparatus for exposing an irradiation target to a charged particle beam emitted from the charged particle beam generation apparatus;

wherein said irradiation apparatus includes a scattering device for increasing the size of said charged particle beam, a range adjustment device for varying the range

of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes; and

wherein at least one of said scattering device, said range adjustment device, and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner as to be movable in a propagation direction of said charged particle beam, and a control apparatus controls movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

36. (Previously Presented) The particle beam irradiation system according to claim 35, wherein said scattering device and said range adjustment device are combined together.

37. (Previously Presented) A particle beam irradiation system, comprising:  
a charged particle beam generation apparatus; and  
an irradiation apparatus for irradiating an irradiation target with a charged particle beam emitted from the charged particle beam generation apparatus;

wherein said irradiation apparatus includes a beam scanner for scanning said charged particle beam, a scattering device for increasing the size of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes; and

wherein at least one of said scattering device and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner as to be movable in a propagation direction of said charged particle beam, and a control apparatus controls

movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

38. (Previously Presented) A particle beam irradiation system, comprising:

a charged particle beam generation apparatus; and

an irradiation apparatus for exposing an irradiation target to a charged particle beam emitted from the charged particle beam generation apparatus;

wherein said irradiation apparatus includes a beam scanner for scanning said charged particle beam, a scattering device for increasing the size of said charged particle beam, a range adjustment device for varying the range of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes; and

wherein at least one of said scattering device, said range adjustment device, and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner that the device is movable in the propagation direction of said charged particle beam, and a control apparatus controls movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

39. (Previously Presented) The particle beam irradiation system according to claim 38, wherein said scattering device and said range adjustment device are combined together.

40. (Previously Presented) The particle beam irradiation system according to claim 38, further comprising a beam scan controller for controlling said beam scanner and controlling the scan of said charged particle beam to which said irradiation target is exposed.

41. (Previously Presented) The particle beam irradiation system according to claim 40, wherein said beam scan controller controls said beam scanner so as to scan said charged particle beam in a scanning pattern for a region within said irradiation target.

42. (Previously Presented) The particle beam irradiation system according to claim 38, wherein a combination of said scattering device and said range adjustment device is installed in said irradiation apparatus in such a manner that the combination is movable in said propagation direction.

43. (Previously Presented) The particle beam irradiation system according to claim 38, wherein said Bragg peak spreading device is positioned upstream of said beam scanner in said propagation direction.

44. (Previously Presented) A particle beam irradiation system, comprising:

- a charged particle beam generation apparatus; and
- an irradiation apparatus for exposing an irradiation target to a charged particle beam emitted from the charged particle beam generation apparatus;

wherein said irradiation apparatus includes a first scattering device for increasing the size of said charged particle beam, a second scattering device through which said charged particle beam passing through said first scattering device passes, and a Bragg peak spreading device through which said charged particle beam passes; and

wherein at least one of said scattering devices and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner as to be movable in a propagation direction of said charged particle beam, and a control apparatus controls movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

45. (Previously Presented) A particle beam irradiation system, comprising:
- a charged particle beam generation apparatus; and
  - an irradiation apparatus for exposing an irradiation target to a charged particle beam emitted from the charged particle beam generation apparatus;
- wherein said irradiation apparatus includes a first scattering device for increasing the size of said charged particle beam, a second scattering device through which said charged particle beam passing through said first scattering device passes, a range adjustment device for varying the range of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes; and
- wherein at least one of said scattering devices, said range adjustment device, and said Bragg peak spreading device is installed in said irradiation apparatus in such a manner as to be movable in a propagation direction of said charged particle beam,

and a control apparatus controls movement of at least one of said scattering device and said Bragg peak spreading device based on therapy plan information.

46. (Previously Presented) The particle beam irradiation system according to claim 45, wherein said first scattering device and said range adjustment device are combined together and the resulting combination of said first scattering device and said range adjustment device is positioned upstream of said second scattering device in said propagation direction.

47. (Previously Presented) The particle beam irradiation system according to claim 46, wherein a combination of said scattering device and said range adjustment device is installed in said irradiation apparatus in such a manner as to be movable in said propagation direction.

48. (Previously Presented) A method of adjusting on irradiation apparatus, which includes a scattering device for increasing the size of a charged particle beam emitted from a charged particle beam generation apparatus and a Bragg peak spreading device through which said charged particle beam passes, and which exposes an irradiation target to said charged particle beam, the method comprising the step of:

moving at least one of said scattering device and said Bragg peak spreading device based on therapy plan information in a propagation direction of said charged particle beam.

49. (Previously Presented) A method of adjusting an irradiation apparatus, which includes a scattering device for increasing the size of a charged particle beam emitted from a charged particle beam generation apparatus, a range adjustment device for varying the range of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes, and which exposes an irradiation target to said charged particle beam, the method comprising the step of:

moving at least one of said scattering device, said range adjustment device, and said Bragg peak spreading device based on therapy plan information in a propagation direction of said charged particle beam.

50. (Previously Presented) The method according to claim 49, wherein said scattering device is allowed to move in said propagation direction in accordance with the irradiation target size being the therapy plan information in a direction perpendicular to said propagation direction.

51. (Previously Presented) The method according to claim 49, wherein said range adjustment device is allowed to move in said propagation direction in accordance with the range of said charged particle beam being the therapy plan information.

52. (Previously Presented) A method of exposing an irradiation target to a charged particle beam emitted from a charged particle beam generation apparatus using an irradiation apparatus which includes a scattering device for increasing the size

of said charged particle beam and a Bragg peak spreading device through which said charged particle beam passes, the method comprising the steps of:

moving at least one of said scattering device and said Bragg peak spreading device based on therapy plan information in the propagation direction of said charged particle beam; and

exposing said irradiation target to said charged particle beam which has passed through said scattering device, said range adjustment device, and said Bragg peak spreading device.

53. (Previously Presented) A method of exposing an irradiation target to a charged particle beam emitted from a charged particle beam generation apparatus using an irradiation apparatus which includes a scattering device for increasing the size of said charged particle beam, a range adjustment device for varying the range of said charged particle beam, and a Bragg peak spreading device through which said charged particle beam passes, the method comprising the steps of:

moving at least one of said scattering device, said range adjustment device, and said Bragg peak spreading device based on therapy plan information in the propagation direction of said charged particle beam; and

exposing said irradiation target to said charged particle beam which has passed through said scattering device, said range adjustment device, and said Bragg peak spreading device.